手 続 補 正 書

（法第１１条の規定による補正）

特許庁審査官　藤村聖子　　殿

１．国際出願の表示

ＰＣＴ／ＪＰ０３／０６８８９

２．出　願　人

名　称　　株式会社フコク
FUKOKU CO., LTD.

あて名　　〒362-0003　日本国埼玉県上尾市菅谷3丁目105番地
105, Sugaya 3-chome, Ageo-shi,
Saitama 362-0003　Japan

国　籍　　日本国　　Ｊａｐａｎ
住　所　　日本国　　Ｊａｐａｎ

３．代　理　人

氏　名　　（６００２）弁理士　北　村　欣　一

KITAMURA, Kinichi

あて名　　〒105-0004　日本国東京都港区新橋２丁目１６番１号
ニュー新橋ビル７０３
703, New Shinbashi Building, 16-1, Shinbashi 2-chome,
Minato-Ku, Tokyo 105-0004　Japan

４．補正の対象　　請求の範囲

５．補正の内容

（１）請求の範囲第１４頁第１項の「構成した」を「構成し、前記慣性質量体は、円環板の積層体からなり、そして円弧状リング片を周方向および厚み方向に結合して、前記円環板の積層体を形成した」に訂正する。

（２）請求の範囲第１４頁第２項は削除する。

（３）請求の範囲第１４頁第３項の「結合することを特徴とする請求項２記載」を「結合するとともに、前記膨出片の基部の両方に凹部を、前記穴の開口端に該凹部と嵌り合う凸部を形成し、前記周方向に隣り合う一方のリング片の膨出片を他方のリング片の穴に締まりばめする際、該膨出片の基部の凹部を該穴の凸部に締まりばめすることを特徴とする請求の範囲第１項記載」に訂正する。

（４）請求の範囲第１４頁第４項は削除する。

（５）請求の範囲第１４頁第５項は削除する。

（６）請求の範囲第１４頁乃至第１５頁第６項の「請求項２～４」を「請求の範囲第１項または第３項」に訂正する。

（７）請求の範囲第１５頁第８項の「請求項２～７項」を「請求の範囲第１、３、６、７項」に訂正する。

（８）請求の範囲第１５頁第９項の「請求の範囲第２～８項」を「請求の範囲第１、３、６～８項」に訂正する。

（９）請求の範囲第１５頁第１０項の「請求の範囲第２～８項」を「請求の範囲第１、３、６～８項」に訂正する。

（１０）請求の範囲第１５頁第１１項の「請求の範囲第２～８項」を「請求の範囲第１、３、６～８項」に訂正する。

（１１）請求の範囲第１５頁第１２項の「請求の範囲第１～８項」を「請求の範囲第１、３、６～８項」に訂正する。

（１２）請求の範囲第１５頁第１３項の「請求の範囲第１～１２項」を「請求の範囲第１、３、６～１２項」に訂正する。

（１３）請求の範囲第１５頁乃至第１５／１頁第１４項の「請求の範囲第１～１３項」を「請求の範囲第１、３、６～１３項」に訂正する。

（１４）請求の範囲第１５／１頁第１５項の「請求の範囲第１～１４項」を「請求の範囲第１、３、６～１４項」に訂正する。

６．添付書類の目録

（１）請求の範囲第１４頁、第１５頁及び第１５／１頁

請求の範囲

1．（補正後）　内燃機関の回転軸に固定するハブと、前記ハブの径方向外方に同軸状に配置され、プーリ溝を外周部に有すると共に所定の慣性質量を有する断面略矩形の環状プーリ本体と、前記ハブの外周面と前記プーリ本体の内周面との間に介在させる弾性体とを備えたトーショナルダンパプーリにおいて、

前記プーリ本体は、その軸方向に開口する凹部を有し、外周部にプーリ溝を有する断面略U字状の環状の金属製の枠体と、前記凹部に固定した環状の慣性質量体とから構成し、前記慣性質量体は、円環板の積層体からなり、そして円弧状リング片を周方向および厚み方向に結合して、前記円環板の積層体を形成したことを特徴とするトーショナルダンパプーリ。

2．（削除）

3．（補正後）　前記リング片の一端に膨出片または該膨出片と嵌り合う穴を、他端に前記穴または前記膨出片を形成し、前記リング片のうちの周方向に隣り合う一方のリング片の膨出片を他方のリング片の穴に締まりばめすることによって、前記リング片を周方向に結合するとともに、前記膨出片の基部の両方に凹部を、前記穴の開口端に該凹部と嵌り合う凸部を形成し、前記周方向に隣り合う一方のリング片の膨出片を他方のリング片の穴に締まりばめする際、該膨出片の基部の凹部を該穴の凸部に締まりばめすることを特徴とする請求の範囲第1項記載のトーショナルダンパプーリ。

4．（削除）

5．　（削除）

6．（補正後）　前記各リング片の一方の面から他方の面に突き出したダボを形成し、前記リング片のうちの厚み方向に隣り合うリング片をダボが周方向にずれるようにして重ね合わせて押圧することにより、リング

片を厚み方向に結合したことを特徴とする請求の範囲第１項または第３記載のトーショナルダンパプーリ。

７．　前記ダボの凸部を凹部をよりも狭く形成することを特徴とする請求の範囲第６項記載のトーショナルダンパプーリ。

８．（補正後）　前記リング片の周方向の結合により円環板を形成し、次いで複数枚の円環板のリング片の厚み方向の結合により、前記積層体を形成したことを特徴とする請求の範囲第１、３、６、７項のいずれかの項に記載のトーショナルダンパプーリ。

９．（補正後）　前記慣性質量体は、前記プーリ本体の凹部を画成する内周壁の内側面に圧接する内径を有する円環板を備え、前記慣性質量体を前記凹部内に圧入することによって固定したことを特徴とする請求の範囲第１、３、６～８項のいずれかの項に記載のトーショナルダンパプーリ。

１０．（補正後）　前記慣性質量体は、前記プーリ本体の凹部を画成する外周壁の内側面に圧接する外径を有する円環板を備え、前記慣性質量体を前記凹部に圧入することによって固定したことを特徴とする請求の範囲第１、３、６～８項のいずれかの項に記載のトーショナルダンパプーリ。

１１．（補正後）　前記慣性質量体は、前記プーリ本体の凹部を画成する外周壁の内側面に圧接する外径を有する第１の円環板と、前記凹部を画成する内周壁の内側面に圧接する内径を有する第２の円環板とを備え、前記慣性質量体を前記凹部に圧入することによって固定したことを特徴とする請求の範囲第１、３、６～８項のいずれかの項に記載のトーショナルダンパプーリ。

１２．（補正後）　前記慣性質量体を前記プーリ本体の凹部にボルトを含む締結手段で固定したことを特徴とする請求の範囲第１、３、６～８項のいずれかの項に記載のトーショナルダンパプーリ。

１３．（補正後）　前記慣性質量体を挿入した前記プーリ本体の凹部に接着剤および／または樹脂を充填したことを特徴とする請求の範囲第１、３、６～１２項のいずれかの項に記載のトーショナルダンパプーリ。

１４．（補正後）　前記ハブの外周部と前記プーリ本体の凹部を画成する内周壁の幅方向の同一箇所に径方向外方または内方の凸部を設けたことを特徴とする請

求の範囲第１、３、６～１３項のいずれかの項に記載のトーショナルダンパプーリ。

１５．（補正後）　前記プーリ本体の凹部を画成する内周壁と外周壁とを繋ぐ壁部を省略して、前記凹部を軸方向両側に開口した貫通穴に形成すると共に、前記内周壁と外周壁とに圧接する内径および外径を有する円環板を少なくとも１枚以上配置するようにして、複数枚の円環板を重ね合わせて結合することによって前記慣性質量体を形成し、前記慣性質量体を前記貫通穴内に圧入したことを特徴とする請求の範囲第１、３、６～１４項のいずれかの項に記載のトーショナルダンパプーリ。

Argument

To: Seiko Fujimura, Examiner, Patent Office

1. Indication of International Application

   PCT/JP03/06889

2. Applicant

   Name: Fukoku Co., Ltd.

   Mailing Address: 105, Sugaya 3-chome, Ageo-shi, Saitama 362-0003 Japan

   Nationality: Japan

   Address: Japan

3. Agent

   Name: Kinichi Kitamura, Patent Attorney (6002)

   Mailing Address: 703, New Shinbashi Building, 16-1, Shinbashi 2-chome, Minato-ku, Tokyo 105-0004 Japan

4. Date of Notification: 17 August 2004

5. Contents of Argument

(1) Inventive step in Claim 1 of the present application

In Cited Document 1, the pulley portion has only a U-shaped cross section. As the pulley portion is connected to the hub portion by friction by means of a

spring, it is a coupling product having a pulley and not a so-called torsional damper for preventing revolution pulsation from arising.

As the torsional damper of the present invention (Claim 1) is a dynamic vibration absorber, in the pulley portion functioning as a damper mass portion of the present invention, an inertial mass adjusted to the vibration system, i.e. an inertial mass complying with a resonance frequency is needed. However, as Cited Document 1 relates to a coupling, there is no thought that an inertial mass element is fixed to the U-shaped portion.

Cited Document 2 relates to a so-called viscous damper in which an inertial mass element is hermetically sealed in annular case together with a viscous liquid and a revolution operation between the body and the case is damped by viscous resistance of the damping liquid, thereby avoiding torsional vibration. Therefore, as the damper is not a mechanism for avoiding vibration by a dynamic vibration absorber, it is not necessary to have it complying with a resonance frequency, as in a dynamic vibration absorber of the present invention and it is preferred that the inertial mass is large, if the volume and weight permit it. Thus, the damper of Cited Document 2 is different from the torsional damper of the present invention using a dynamic vibration absorber.

As is clear from the above, there is neither disclosure nor suggestion of the thought of the present invention (Claim 1), when Cited Documents 2 is taken into consideration in combination with Cited Document 1. Consequently, we argue that the present invention cannot be easily reached from Cited Documents 1 and 2.

(2) As the invention described in Claim 1 has patentability over Cited

Documents, the invention described in claims dependent from Claim 1 also has patentability. With respect to some claims, the following can be mentioned.

Inventive step of Claim 3

In Cited Document 3, as a method for bonding ring pieces, there is described one in which a concave portion is formed on one side of a base portion of a protruded piece for engaging and a convex portion is formed at a corresponding side of an open end of a hole for fitting the protruded piece. However, the concave portion and the convex portion in Cited Document 3 have the same shape as that of the protruded piece. When ring pieces are bonded, the hole sides of both rings extend similarly naturally. In Cited Document 2, there is no thought of avoiding the extension.

By contrast, in the present invention (Claim 3), when the protruded piece and the hole are close-fitted by the convex portion and the concave portion, even when the hole is extended by the protruded, deformation is pressed down and absorbed at the fitting portion of the convex portion at the base portion of the hole and the concave portion at the base portion of the protruded piece. The idea of the present invention is totally different from that of Cited Document 3.

Amendment

(Amendment under Rule 11)

To: Commissioner, Patent Office

1. Indication of International Application

PCT/JP03/06889

2. Applicant (Representative)

Name: Fukoku Co., Ltd.

Address: 105, Sugaya 3-chome, Ageo-shi, Saitama 362-0003 Japan

Nationality: Japan

Address: Japan

3. Agent

Name: (6002) Kinichi Kitamura, Patent Attorney

Address: 703, New Shinbashi Building, 16-1, Shinbashi 2-chome, Minato-ku, Tokyo 105-0004 Japan

4. Object of Amendment

Claims

5. Contents of Amendment

(1) In Page 14, Claim 1, to amend "an annular frame" to --an annular

metallic frame--.

(2) Page 14, Claim 2, to amend "The torsional damper ... and bonding them." to --The torsional damper ... a width direction.--.

(3) Page 14, Claim 3, to amend "The torsional damper ... plates are bonded." to --The viscous damper ... adjacent ring pieces.--.

(4) Page 14, Claim 4, to amend "The torsional damper ... plates are bonded" to --The viscous damper ... of said hole.--.

(5) Page 14, Claim 5, to amend "The torsional damper ... a concave portion." to --The viscous damper ... and pressing them.--.

(6) Page 14, Claim 6, to amend "The viscous damper ... an annular form." to --The viscous damper ... and pressing them.--.

(7) Page 14, Claim 7, to amend "The viscous damper ... the annular form." to --The viscous damper ... a concave portion.--.

(8) Pages 14 and 15, Claim 8, to amend "The torsional damper ... of said hole." to --The viscous damper ... said ring piece.--.

(9) Page 15, Claim 13, to amend "The torsional damper ... said pulley body." to --The torsional damper ... element is inserted.--.

(10) Page 15, Claim 14, to amend "The torsional damper ... into said through-hole." to --The torsional damper ... said pulley body.--.

(11) Page 15, to add Claim 15.

6. List of Document Attached

(1) Pages 14, 15 and 15/1

CLAIMS

1. (Amended) A torsional damper pulley comprising a hub fixed at a revolving shaft of an internal combustion engine, an annular pulley body substantially rectangular in section, which is coaxially placed outside said hub in its diameter direction, has a pulley groove at an outer circumferential portion and has a predetermined inertia mass, and an elastic solid interposed between an outer circumferential surface of said hub and an inner circumferential surface of said pulley body, wherein said pulley body comprises an annular metallic frame substantially U-shaped in section, which has a concave portion open in its axial direction and has a pulley groove at an outer circumferential portion, and an annular inertia mass element fixed in said concave portion.

2. (Amended) The Torsional damper pulley according to claim 1, wherein said inertia mass element is comprised of a laminate of annular plates which is formed by bonding arc-shaped ring pieces in a circumferential direction and a width direction.

3. (Amended) The torsional damper pulley according to claim 2, wherein a protruded piece or a fitting hole fitted to the protruded piece is formed at one end of said ring piece,

said hole or said protruded piece is formed at the other end of said ring piece, and said ring pieces are bonded in a circumferential direction by close-fitting the protruded piece of one of ring pieces adjacent in a circumferential direction into the hole of the other one of the adjacent ring pieces.

4. (Amended) The torsional damper pulley according to claim 3, wherein a concave portion is formed at least at one side of a base portion of said protruded piece of said ring piece, and a protruded portion fitted in the concave portion is formed at a corresponding side of an open end of said hole, and when the protruded piece of one of said ring pieces adjacent in a circumferential direction is close-fitted into the hole of the other one of said adjacent ring pieces, the concave portion of the base portion of said protruded piece is close-fitted into the protruded portion of said hole.

5. (Amended) The torsional damper pulley according to any one of claims 2 to 4, wherein a cut-and-bent piece is formed on a surface of said ring piece, and said ring pieces are bonded in a width direction by overlaying said ring pieces adjacent in a width direction so that the cut-and-bent pieces are overlaid on each other and pressing them.

6. (Amended) The torsional damper pulley according to any one of claims 2 to 4 , wherein dowels protruded from one surface of said ring piece to the other surface are formed, and said ring pieces are bonded in a width direction by overlaying said ring pieces adjacent in a width direction so that the dowels are displaced in a circumferential direction and pressing them.

7. (Amended) The torsional damper pulley according to claim 6, wherein a convex portion of said dowel is formed to be narrower than a concave portion.

8. (Amended) The torsional damper pulley according to any one of claims 2 to 7, wherein the annular plate is formed by bonding said ring pieces in a circumferential direction, and said laminate is formed by bonding a plurality of the annular plates in a width direction of said ring piece.

9. The torsional damper pulley according to any one of claims 2 to 8 wherein said inertia mass element comprises an annular plate having an inner diameter to be in pressure-contact with an inner surface of the inner circumferential wall for defining the concave portion of said pulley body, and said inertia mass element is fixed by being press-fitted into

said concave portion.

10. The torsional damper pulley according to any one of claims 2 to 8 wherein said inertia mass element comprises an annular plate having an outer diameter to be in pressure-contact with an inner surface of an outer circumferential wall for defining the concave portion of said pulley body, and said inertia mass element is fixed by being press-fitted into said concave portion.

11. The torsional damper pulley according to any one of claims 2 to 8, wherein said inertia mass element comprises a first annular plate having an outer diameter to be in pressure-contact with an inner surface of an outer circumferential wall for defining the concave portion of said pulley body, and a second annular plate having an inner diameter to be in pressure-contact with an inner surface of an inner circumferential wall for defining said concave portion, and said inertia mass element is fixed by being press-fitted into said concave portion.

12. The torsional damper pulley according to any one of claims 1 to 8, wherein said inertia mass element is fixed to the concave portion of said pulley body with fastening means

including a bolt.

13. (Amended) The torsional damper pulley according to any one of claims 1 to 12, wherein an adhesive and/or a resin are/is filled into the concave portion of said pulley body into which said inertia mass element is inserted.

14. (Amended) The torsional damper pulley according to any one of claims 1 to 13, wherein convex portions outward or inward in a diameter direction are provided at the same positions in a width direction of the outer circumferential portion of said hub and an inner circumferential wall for defining a concave portion of said pulley body.

15. (Added) The torsional damper pulley according to any one of claims 1to 14, wherein a wall portion for connecting an inner circumferential wall and an outer circumferential wall for defining the concave portion of said pulley body is omitted, whereby said concave portion is formed to be a through-hole open to both sides in an axial direction, said inertia mass element is formed by overlaying a plurality of annular plates on each other and bonding them so that at least one annular plate having an inner diameter and outer diameter to be in pressure-contact with said inner circumferential wall

and outer circumferential wall is placed, and said inertia mass element is press-fitted into said through-hole.